

SEQUENCE LISTING

5 <110> Agrico

10 <120> Resistant plants and uses thereof

15 <130> AE 20030596

20 <160> 94

25 <210> 1
<211> 380430 <212> DNA
<213> Solanum bulbocastanum

35 <220>

40 <221> CDS
<222> (1)..(3804)
<223>

45	<400> 1 atg gaa aaa cga aaa gat aat gaa gaa gca aac aac tca ttg gag tca Met Glu Lys Arg Lys Asp Asn Glu Glu Ala Asn Asn Ser Leu Glu Ser 1 5 10 15	48
50	ttt tct gct ctt cgc aag gat gct gcc aat gtt ctg gat ttc cta gag Phe Ser Ala Leu Arg Lys Asp Ala Ala Asn Val Leu Asp Phe Leu Glu 20 25 30	96
55	aga tta aag aat gaa gaa gat caa aag gct gtt gat gtg gat ctg att Arg Leu Lys Asn Glu Glu Asp Gln Lys Ala Val Asp Val Asp Leu Ile 35 40 45	144
60	gaa agc ctg aaa ttg aag ctg aca ttt att tgt aca tat gtc cag ctt Glu Ser Leu Lys Leu Lys Leu Thr Phe Ile Cys Thr Tyr Val Gln Leu 50 55 60	192
65	tct tat tcc gat ttg gag aag ttt gaa gat ata atg act aga aaa aga Ser Tyr Ser Asp Leu Glu Lys Phe Glu Asp Ile Met Thr Arg Lys Arg 65 70 75 80	240
65	caa gag gtt gag aat ctg ctt caa cca att ttg gat gat gat ggc aaa Gln Glu Val Glu Asn Leu Leu Gln Pro Ile Leu Asp Asp Asp Gly Lys 85 90 95	288

gac gtc ggg tgt aaa tat gtc ctt act agc ctc gcc ggt aat atg gat Asp Val Gly Cys Lys Tyr Val Leu Thr Ser Leu Ala Gly Asn Met Asp 100 105 110	336
5 gac tgt ata agc ttg tat cat cgt tct aaa tca gat gcc acc atg atg Asp Cys Ile Ser Leu Tyr His Arg Ser Lys Ser Asp Ala Thr Met Met 115 120 125	384
10 gat gag caa ttg ggc ttc ctc ctc ttg aat ctc tct cat cta tcc aag Asp Glu Gln Leu Gly Phe Leu Leu Leu Asn Leu Ser His Leu Ser Lys 130 135 140	432
15 cat cgt gct gaa aag atg ttt cct gga gtg act caa tat gag gtt ctt His Arg Ala Glu Lys Met Phe Pro Gly Val Thr Gln Tyr Glu Val Leu 145 150 155 160	480
20 cag aat gta tgt ggc aac ata aga gat ttc cat gga ttg ata gtg aat Gln Asn Val Cys Gly Asn Ile Arg Asp Phe His Gly Leu Ile Val Asn 165 170 175	528
25 tgt tgc att aag cat gag atg gtt gag aat gtc tta tct ctg ttt caa Cys Cys Ile Lys His Glu Met Val Glu Asn Val Leu Ser Leu Phe Gln 180 185 190	576
30 ctg atg gct gag aga gta gga cgc ttc ctt tgg gag gat cag gct gat Leu Met Ala Glu Arg Val Gly Arg Phe Leu Trp Glu Asp Gln Ala Asp 195 200 205	624
35 gaa gac tct caa ctc tcc gag cta gat gag gat gat cag aat gat aaa Glu Asp Ser Gln Leu Ser Glu Leu Asp Glu Asp Asp Gln Asn Asp Lys 210 215 220	672
40 gac cct caa ctc ttc aag cta gca cat cta ctc ttg aag att gtt cca Asp Pro Gln Leu Phe Lys Leu Ala His Leu Leu Leu Lys Ile Val Pro 225 230 235 240	720
45 act gaa ttg gag gtt atg cac ata tgt tat aaa act ttg aaa gct tca Thr Glu Leu Glu Val Met His Ile Cys Tyr Lys Thr Leu Lys Ala Ser 245 250 255	768
50 act tca aca gaa att gga cgc ttc att aag aag ctc ctg gaa acc tct Thr Ser Thr Glu Ile Gly Arg Phe Ile Lys Lys Leu Leu Glu Thr Ser 260 265 270	816
55 ccg gac att ctc aga gaa tat ctg att cat cta caa gag cat atg ata Pro Asp Ile Leu Arg Glu Tyr Leu Ile His Leu Gln Glu His Met Ile 275 280 285	864
60 act gtt att acc cct aac act tca ggg gct cga aac att cat gtc atg Thr Val Ile Thr Pro Asn Thr Ser Gly Ala Arg Asn Ile His Val Met 290 295 300	912
65 atg gaa ttc cta ttg att att ctt tct gat atg ccg ccc aag gac ttt Met Glu Phe Leu Leu Ile Ile Leu Ser Asp Met Pro Pro Lys Asp Phe 305 310 315 320	960
70 att cat cat gac aaa ctt ttt gat ctc ttg gct cgt gtt gta gca ctt Ile His His Asp Lys Leu Phe Asp Leu Leu Ala Arg Val Val Ala Leu 325 330 335	1008
75 acc agg gag gta tca act ctt gta cgc gac ttg gaa gag aaa tta agg Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu Glu Glu Lys Leu Arg 340 345 350	1056
80 65 att aaa gag agt act gac gaa aca aat tgt gca acc cta aag ttt ctg Ile Lys Glu Ser Thr Asp Glu Thr Asn Cys Ala Thr Leu Lys Phe Leu 355 360 365	1104

gaa aat att gaa ctc ctt aag gaa gat ctc aaa cat gtt tat ctg aaa	370	375	380	1152
Glu Asn Ile Glu Leu Leu Lys Glu Asp Leu Lys His Val Tyr Leu Lys				
5 gtc ccg gat tca tct caa tat tgc ttc ccc atg agt gat gga cct ctc	385	390	395	1200
Val Pro Asp Ser Ser Gln Tyr Cys Phe Pro Met Ser Asp Gly Pro Leu				
10 ttc atg cat ctg cta cag aga cac tta gat gat ttg ctg gat tcc aat	405	410	415	1248
Phe Met His Leu Leu Gln Arg His Leu Asp Asp Leu Leu Asp Ser Asn				
15 gct tat tca att gct ttg ata aag gaa caa att ggg ctg gtg aaa gaa	420	425	430	1296
Ala Tyr Ser Ile Ala Leu Ile Lys Glu Gln Ile Gly Leu Val Lys Glu				
20 gac ttg gaa ttc ata aga tct ttt ttc gcg aat att gag caa gga ttg	435	440	445	1344
Asp Leu Glu Phe Ile Arg Ser Phe Phe Ala Asn Ile Glu Gln Gly Leu				
25 tat aaa gat ctc tgg gaa cgt gtt cta gat gtg gca tat gag gca aaa	450	455	460	1392
Tyr Lys Asp Leu Trp Glu Arg Val Leu Asp Val Ala Tyr Glu Ala Lys				
30 att ttc tca ctt ccc att acc aga aag aag atg atg ctt atc aaa gaa	485	490	495	1488
Ile Phe Ser Leu Pro Ile Thr Arg Lys Lys Met Met Leu Ile Lys Glu				
35 gag gtc tct gat tta cat gag aac att tcc aag aac aga ggt ctc atc	500	505	510	1536
Glu Val Ser Asp Leu His Glu Asn Ile Ser Lys Asn Arg Gly Leu Ile				
40 gtt gtg aac tct ccc aag aaa cca gtt gag agc aag tca ttg aca act	515	520	525	1584
Val Val Asn Ser Pro Lys Lys Pro Val Glu Ser Lys Ser Leu Thr Thr				
45 gat aaa ata att gta ggt ttt ggt gag gag aca aac ttg ata ctt aga	530	535	540	1632
Asp Lys Ile Ile Val Gly Phe Gly Glu Glu Thr Asn Leu Ile Leu Arg				
50 aag ctc acc agt gga ccg gca gat cta gat gtc att tcg atc att ggt	545	550	555	1680
Lys Leu Thr Ser Gly Pro Ala Asp Leu Asp Val Ile Ser Ile Ile Gly				
55 atg ccg ggt tta ggt aaa act act ttg gcg tac aaa gta tac aat gat	565	570	575	1728
Met Pro Gly Leu Gly Lys Thr Leu Ala Tyr Lys Val Tyr Asn Asp				
aaa tca gtt tct agc cat ttc gac ctt cgt gca tgg tgc acg gtc gac	580	585	590	1776
Lys Ser Val Ser His Phe Asp Leu Arg Ala Trp Cys Thr Val Asp				
60 caa gta tat gac gag aag aag ttg ttg gat aaa att ttc aat caa gtt	595	600	605	1824
Gln Val Tyr Asp Glu Lys Lys Leu Leu Asp Lys Ile Phe Asn Gln Val				
65 agt gac tca aat tca aaa ttg agt gag aat att gat gtt gct gat aaa	610	615	620	1872
Ser Asp Ser Asn Ser Lys Leu Ser Glu Asn Ile Asp Val Ala Asp Lys				
cta cgg aaa caa ttg ttt gga aag agg tat ctt att gtc tta gat gac	625	630	635	1920
Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu Ile Val Leu Asp Asp				

gtg tgg gat act aat aca tgg gat gag cta aca aga cct ttt cct gat Val Trp Asp Thr Asn Thr Trp Asp Glu Leu Thr Arg Pro Phe Pro Asp	645	650	655	1968	
5 ggt atg aaa gga agt aga att att ttg aca act cga gaa aag aaa gtt Gly Met Lys Gly Ser Arg Ile Ile Leu Thr Arg Glu Lys Lys Val	660	665	670	2016	
10 gct ttg cat gga aag ctc tac act gat cct ctt aac ctt cga ttg cta Ala Leu His Gly Lys Leu Tyr Thr Asp Pro Leu Asn Leu Arg Leu Leu	675	680	685	2064	
15 aga tca gaa gaa agt tgg gag tta tta gag aaa agg gca ttt gga aac Arg Ser Glu Glu Ser Trp Glu Leu Leu Glu Lys Arg Ala Phe Gly Asn	690	695	700	2112	
20 gag agt tgc cct gat gaa cta ttg gat gtt ggt aaa gaa ata gcc gaa Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly Lys Glu Ile Ala Glu	705	710	715	720	2160
25 aat tgt aaa ggg ctt cct ttg gtg gat ctg att gct gga atc att Asn Cys Lys Gly Leu Pro Leu Val Val Asp Leu Ile Ala Gly Ile Ile	725	730	735	2208	
30 gct ggg agg gaa aag aaa aag agt gtt tgg ctt gaa gtt gta aat aat Ala Gly Arg Glu Lys Lys Ser Val Trp Leu Glu Val Val Asn Asn	740	745	750	2256	
35 ttg cat tcc ttt att ttg aag aat gaa gtt gaa gtt atg aaa gtt ata Leu His Ser Phe Ile Leu Lys Asn Glu Val Val Met Lys Val Ile	755	760	765	2304	
40 gaa ata agt tat gac cac tta cct gat cac ctg aag cca tgc ttg ctg Glu Ile Ser Tyr Asp His Leu Pro Asp His Leu Lys Pro Cys Leu Leu	770	775	780	2352	
45 tac ttt gca agt gcg ccg aag gac tgg gta acg aca atc cat gag ttg Tyr Phe Ala Ser Ala Pro Lys Asp Trp Val Thr Thr Ile His Glu Leu	785	790	795	800	2400
50 aaa ctt att tgg ggt ttt gaa gga ttt gtt gaa aag aca gat atg aag Lys Leu Ile Trp Gly Phe Glu Gly Phe Val Glu Lys Thr Asp Met Lys	805	810	815	2448	
55 agt ctg gaa gaa gtt gtt aaa att tat ttg gat gat tta att tcc agt Ser Leu Glu Val Val Lys Ile Tyr Leu Asp Asp Leu Ile Ser Ser	820	825	830	2496	
60 agc ttg gta att tgt ttc aat gag ata ggt gat tac cct act tgc caa Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Asp Tyr Pro Thr Cys Gln	835	840	845	2544	
65 ctt cat gat ctt gtt cat gac ttt tgt ttg ata aaa gca aga aag gaa Leu His Asp Leu Val His Asp Phe Cys Leu Ile Lys Ala Arg Lys Glu	850	855	860	2592	
70 aag ttg tgt gat cgg ata agt tca agt gct cca tca gat ttg ttg cca Lys Leu Cys Asp Arg Ile Ser Ser Ala Pro Ser Asp Leu Leu Pro	865	870	875	880	2640
75 cgt caa att agc att gat tat gat gat gat gaa gag cac ttt ggg ctt Arg Gln Ile Ser Ile Asp Tyr Asp Asp Glu Glu His Phe Gly Leu	885	890	895	2688	
80 aat ttt gtc ctg ttc ggt tca aat aag aaa agg cat tcc ggt aaa cac Asn Phe Val Leu Phe Gly Ser Asn Lys Lys Arg His Ser Gly Lys His	900	905	910	2736	

ctc tat tct ttg acc ata aat gga gat gag ctg gac gac cat ctt tct 2784
 Leu Tyr Ser Leu Thr Ile Asn Gly Asp Glu Leu Asp Asp His Leu Ser
 915 920 925

5 gat aca ttt cat cta aga cac ttg agg ctt ctt aga acc ttg cac ctg 2832
 Asp Thr Phe His Leu Arg His Leu Arg Leu Leu Arg Thr Leu His Leu.
 930 935 940

10 gaa tcc tct ttt atc atg gtt aaa gat tct ttg ctg aat gaa ata tgc 2880
 Glu Ser Ser Phe Ile Met Val Lys Asp Ser Leu Leu Asn Glu Ile Cys
 945 950 955 960

15 atg ttg aat cat ttg agg tac tta agc att ggg aca gaa gtt aaa tct 2928
 Met Leu Asn His Leu Arg Tyr Leu Ser Ile Gly Thr Glu Val Lys Ser
 965 970 975

20 ctg cct ttg tct ttc tca aac ctc tgg aat cta gaa atc ttg ttt gtg 2976
 Leu Pro Leu Ser Phe Ser Asn Leu Trp Asn Leu Glu Ile Leu Phe Val
 980 985 990

25 gat aac aaa gaa tca acc ttg ata cta tta ccg aga att tgg gat ctt 3024
 Asp Asn Lys Glu Ser Thr Leu Ile Leu Leu Pro Arg Ile Trp Asp Leu
 995 1000 1005

30 gta aag ttg caa gtg ctg ttc acg act gct tgg tct ttc ttt gat 3069
 Val Lys Leu Gln Val Leu Phe Thr Thr Ala Cys Ser Phe Phe Asp
 1010 1015 1020

35 atg gat gca gat gaa tca ata ctg ata gca gag gac aca aag tta 3114
 Met Asp Ala Asp Glu Ser Ile Leu Ile Ala Glu Asp Thr Lys Leu
 1025 1030 1035

40 gag aac ttg aca gca tta ggg gaa ctc gtg ctt tcc tat tgg aaa 3159
 Glu Asn Leu Thr Ala Leu Gly Glu Leu Val Leu Ser Tyr Trp Lys
 1040 1045 1050

45 gat aca gag gat att ttc aaa agg ctt ccc aat ctt caa gtg ctt 3204
 Asp Thr Glu Asp Ile Phe Lys Arg Leu Pro Asn Leu Gln Val Leu
 1055 1060 1065

50 cat ttc aaa ctc aag gag tca tgg gat tat tca aca gag caa tat 3249
 His Phe Lys Leu Lys Glu Ser Trp Asp Tyr Ser Thr Glu Gln Tyr
 1070 1075 1080

55 tgg ttc ccg aaa ttg gat ttc cta act gaa cta gaa aaa ctc act 3294
 Trp Phe Pro Lys Leu Asp Phe Leu Thr Glu Leu Glu Lys Leu Thr
 1085 1090 1095

60 gta gat ttt gaa aga tca aac aca aat gac agt ggg tcc tct gca 3339
 Val Asp Phe Glu Arg Ser Asn Thr Asn Asp Ser Gly Ser Ser Ala
 1100 1105 1110

65 gcc ata aat cgg cca tgg gat ttt cac ttt cct tcg agt ttg aaa 3384
 Ala Ile Asn Arg Pro Trp Asp Phe His Phe Pro Ser Ser Leu Lys
 1115 1120 1125

70 aga ttg caa ttg cat gaa ttt cct ctg aca tcc gat tca cta tca 3429
 Arg Leu Gln Leu His Glu Phe Pro Leu Thr Ser Asp Ser Leu Ser
 1130 1135 1140

75 aca ata gcg aga ctg ctg aac ctt gaa gag ttg tac ctt tat cgt 3474
 Thr Ile Ala Arg Leu Leu Asn Leu Glu Glu Leu Tyr Leu Tyr Arg
 1145 1150 1155

80 65 aca atc atc cat ggg gaa gaa tgg aac atg gga gaa gaa gac acc 3519
 Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu Glu Asp Thr
 1160 1165 1170

6

ttt gag aat ctc aaa tgt ttg atg ttg agt caa gtg att ctt tcc	1175	1180	1185	3564
Phe Glu Asn Leu Lys Cys Leu Met Leu Ser Gln Val Ile Leu Ser				
5 aag tgg gag gtt gga gag gaa tct ttt ccc acg ctt gag aaa tta	1190	1195	1200	3609
Lys Trp Glu Val Gly Glu Ser Phe Pro Thr Leu Glu Lys Leu				
10 gaa ctg tcg gac tgt cat aat ctt gag gag att ccg tct agt ttt	1205	1210	1215	3654
Glu Leu Ser Asp Cys His Asn Leu Glu Glu Ile Pro Ser Ser Phe				
15 ggg gat att tat tcc ttg aaa att atc gaa ctt gta agg agc cct	1220	1225	1230	3699
Gly Asp Ile Tyr Ser Leu Lys Ile Ile Glu Leu Val Arg Ser Pro				
20 caa ctt gaa aat tcc gct ctc aag att aag gaa tat gct gaa gat	1235	1240	1245	3744
Gln Leu Glu Asn Ser Ala Leu Lys Ile Lys Glu Tyr Ala Glu Asp				
25 ccg tta ttt aag tag aag gat atc	1265			3804
Pro Leu Phe Lys				
30 <210> 2				
<211> 1267				
<212> PRT				
35 <213> Solanum bulbocastanum				
40 <400> 2				
Met Glu Lys Arg Lys Asp Asn Glu Glu Ala Asn Asn Ser Leu Glu Ser	1	5	10	15
45 Phe Ser Ala Leu Arg Lys Asp Ala Ala Asn Val Leu Asp Phe Leu Glu	20	25	30	
50 Arg Leu Lys Asn Glu Glu Asp Gln Lys Ala Val Asp Val Asp Leu Ile	35	40	45	
55 Glu Ser Leu Lys Leu Lys Leu Thr Phe Ile Cys Thr Tyr Val Gln Leu	50	55	60	
60 Ser Tyr Ser Asp Leu Glu Lys Phe Glu Asp Ile Met Thr Arg Lys Arg	65	70	75	80
Gln Glu Val Glu Asn Leu Leu Gln Pro Ile Leu Asp Asp Asp Gly Lys	85	90	95	
65 Asp Val Gly Cys Lys Tyr Val Leu Thr Ser Leu Ala Gly Asn Met Asp	100	105	110	

Asp Cys Ile Ser Leu Tyr His Arg Ser Lys Ser Asp Ala Thr Met Met
115 120 125

5 Asp Glu Gln Leu Gly Phe Leu Leu Leu Asn Leu Ser His Leu Ser Lys
130 135 140

10 His Arg Ala Glu Lys Met Phe Pro Gly Val Thr Gln Tyr Glu Val Leu
145 150 155 160

15 Gln Asn Val Cys Gly Asn Ile Arg Asp Phe His Gly Leu Ile Val Asn
165 170 175

20 Cys Cys Ile Lys His Glu Met Val Glu Asn Val Leu Ser Leu Phe Gln
180 185 190

25 Leu Met Ala Glu Arg Val Gly Arg Phe Leu Trp Glu Asp Gln Ala Asp
195 200 205

30 Glu Asp Ser Gln Leu Ser Glu Leu Asp Glu Asp Asp Gln Asn Asp Lys
210 215 220

35 Asp Pro Gln Leu Phe Lys Leu Ala His Leu Leu Leu Lys Ile Val Pro
225 230 235 240

40 Thr Glu Leu Glu Val Met His Ile Cys Tyr Lys Thr Leu Lys Ala Ser
245 250 255

45 Thr Ser Thr Glu Ile Gly Arg Phe Ile Lys Lys Leu Leu Glu Thr Ser
260 265 270

50 Pro Asp Ile Leu Arg Glu Tyr Leu Ile His Leu Gln Glu His Met Ile
275 280 285

55 Thr Val Ile Thr Pro Asn Thr Ser Gly Ala Arg Asn Ile His Val Met
290 295 300

60 Met Glu Phe Leu Leu Ile Ile Leu Ser Asp Met Pro Pro Lys Asp Phe
305 310 315 320

65 Ile His His Asp Lys Leu Phe Asp Leu Leu Ala Arg Val Val Ala Leu
325 330 335

70 Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu Glu Glu Lys Leu Arg
340 345 350

75 Ile Lys Glu Ser Thr Asp Glu Thr Asn Cys Ala Thr Leu Lys Phe Leu
355 360 365

80 Glu Asn Ile Glu Leu Leu Lys Glu Asp Leu Lys His Val Tyr Leu Lys
370 375 380

Val Pro Asp Ser Ser Gln Tyr Cys Phe Pro Met Ser Asp Gly Pro Leu
385 390 395 400

5 Phe Met His Leu Leu Gln Arg His Leu Asp Asp Leu Leu Asp Ser Asn
405 410 415

10 Ala Tyr Ser Ile Ala Leu Ile Lys Glu Gln Ile Gly Leu Val Lys Glu
420 425 430

15 Asp Leu Glu Phe Ile Arg Ser Phe Phe Ala Asn Ile Glu Gln Gly Leu
435 440 445

20 Tyr Lys Asp Leu Trp Glu Arg Val Leu Asp Val Ala Tyr Glu Ala Lys
450 455 460

20 Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn Gly Leu Leu His Leu
465 470 475 480

25 Ile Phe Ser Leu Pro Ile Thr Arg Lys Lys Met Met Leu Ile Lys Glu
485 490 495

30 Glu Val Ser Asp Leu His Glu Asn Ile Ser Lys Asn Arg Gly Leu Ile
500 505 510

35 Val Val Asn Ser Pro Lys Lys Pro Val Glu Ser Lys Ser Leu Thr Thr
515 520 525

40 Asp Lys Ile Ile Val Gly Phe Gly Glu Glu Thr Asn Leu Ile Leu Arg
530 535 540

45 Lys Leu Thr Ser Gly Pro Ala Asp Leu Asp Val Ile Ser Ile Ile Gly
545 550 555 560

50 Met Pro Gly Leu Gly Lys Thr Thr Leu Ala Tyr Lys Val Tyr Asn Asp
565 570 575

55 Lys Ser Val Ser Ser His Phe Asp Leu Arg Ala Trp Cys Thr Val Asp
580 585 590

55 Gln Val Tyr Asp Glu Lys Lys Leu Leu Asp Lys Ile Phe Asn Gln Val
595 600 605

60 Ser Asp Ser Asn Ser Lys Leu Ser Glu Asn Ile Asp Val Ala Asp Lys
610 615 620

65 Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu Ile Val Leu Asp Asp
625 630 635 640

65 Val Trp Asp Thr Asn Thr Trp Asp Glu Leu Thr Arg Pro Phe Pro Asp
645 650 655

Gly Met Lys Gly Ser Arg Ile Ile Leu Thr Thr Arg Glu Lys Lys Val
660 665 670

5

Ala Leu His Gly Lys Leu Tyr Thr Asp Pro Leu Asn Leu Arg Leu Leu
675 680 685

10 Arg Ser Glu Glu Ser Trp Glu Leu Leu Glu Lys Arg Ala Phe Gly Asn
690 695 700

15 Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly Lys Glu Ile Ala Glu
705 710 715 720

20 Asn Cys Lys Gly Leu Pro Leu Val Val Asp Leu Ile Ala Gly Ile Ile
725 730 735

25 Ala Gly Arg Glu Lys Lys Ser Val Trp Leu Glu Val Val Asn Asn
740 745 750

Leu His Ser Phe Ile Leu Lys Asn Glu Val Glu Val Met Lys Val Ile
755 760 765

30 Glu Ile Ser Tyr Asp His Leu Pro Asp His Leu Lys Pro Cys Leu Leu
770 775 780

35 Tyr Phe Ala Ser Ala Pro Lys Asp Trp Val Thr Thr Ile His Glu Leu
785 790 795 800

40 Lys Leu Ile Trp Gly Phe Glu Gly Phe Val Glu Lys Thr Asp Met Lys
805 810 815

Ser Leu Glu Glu Val Val Lys Ile Tyr Leu Asp Asp Leu Ile Ser Ser
820 825 830

45 Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Asp Tyr Pro Thr Cys Gln
835 840 845

50 Leu His Asp Leu Val His Asp Phe Cys Leu Ile Lys Ala Arg Lys Glu
850 855 860

55 Lys Leu Cys Asp Arg Ile Ser Ser Ala Pro Ser Asp Leu Leu Pro
865 870 875 880

60 Arg Gln Ile Ser Ile Asp Tyr Asp Asp Glu Glu His Phe Gly Leu
885 890 895

65 Asn Phe Val Leu Phe Gly Ser Asn Lys Lys Arg His Ser Gly Lys His
900 905 910

Leu Tyr Ser Leu Thr Ile Asn Gly Asp Glu Leu Asp Asp His Leu Ser
915 920 925

Asp Thr Phe His Leu Arg His Leu Arg Leu Leu Arg Thr Leu His Leu
 930 935 940
 5 Glu Ser Ser Phe Ile Met Val Lys Asp Ser Leu Leu Asn Glu Ile Cys
 945 950 955 960
 10 Met Leu Asn His Leu Arg Tyr Leu Ser Ile Gly Thr Glu Val Lys Ser
 965 970 975
 15 Leu Pro Leu Ser Phe Ser Asn Leu Trp Asn Leu Glu Ile Leu Phe Val
 980 985 990
 Asp Asn Lys Glu Ser Thr Leu Ile Leu Leu Pro Arg Ile Trp Asp Leu
 995 1000 1005
 20 Val Lys Leu Gln Val Leu Phe Thr Thr Ala Cys Ser Phe Phe Asp
 1010 1015 1020
 25 Met Asp Ala Asp Glu Ser Ile Leu Ile Ala Glu Asp Thr Lys Leu
 1025 1030 1035
 30 Glu Asn Leu Thr Ala Leu Gly Glu Leu Val Leu Ser Tyr Trp Lys
 1040 1045 1050
 Asp Thr Glu Asp Ile Phe Lys Arg Leu Pro Asn Leu Gln Val Leu
 35 1055 1060 1065
 His Phe Lys Leu Lys Glu Ser Trp Asp Tyr Ser Thr Glu Gln Tyr
 1070 1075 1080
 40 Trp Phe Pro Lys Leu Asp Phe Leu Thr Glu Leu Glu Lys Leu Thr
 1085 1090 1095
 45 Val Asp Phe Glu Arg Ser Asn Thr Asn Asp Ser Gly Ser Ser Ala
 1100 1105 1110
 50 Ala Ile Asn Arg Pro Trp Asp Phe His Phe Pro Ser Ser Leu Lys
 1115 1120 1125
 55 Arg Leu Gln Leu His Glu Phe Pro Leu Thr Ser Asp Ser Leu Ser
 1130 1135 1140
 Thr Ile Ala Arg Leu Leu Asn Leu Glu Glu Leu Tyr Leu Tyr Arg
 1145 1150 1155
 60 Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu Glu Asp Thr
 1160 1165 1170
 65 Phe Glu Asn Leu Lys Cys Leu Met Leu Ser Gln Val Ile Leu Ser
 1175 1180 1185

Lys Trp Glu Val Gly Glu Glu Ser Phe Pro Thr Leu Glu Lys Leu
1190 1195 1200

5 Glu Leu Ser Asp Cys His Asn Leu Glu Glu Ile Pro Ser Ser Phe
1205 1210 1215

10 Gly Asp Ile Tyr Ser Leu Lys Ile Ile Glu Leu Val Arg Ser Pro
1220 1225 1230

15 Gln Leu Glu Asn Ser Ala Leu Lys Ile Lys Glu Tyr Ala Glu Asp
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20 Met Arg Gly Gly Asp Glu Leu Gln Ile Leu Gly Gln Lys Asp Ile
1250 1255 1260

Pro Leu Phe Lys
1265

25 <210> 3

<211> 3890

30 <212> DNA

<213> Solanum bulbocastanum

35 <220>

<221> gene

40 <222> (1)...(3890)

<223> Coding nucleic acid sequence of the Rpi-blb2 gene including the i
ntron sequence (position 43-128).

45 <220>

<221> Intron

50 <222> (43)...(128)

<223> Coding nucleic acid sequence of the Rpi-blb2 gene including the i
ntron sequence (position 43-128).

55 <400> 3
60 atggaaaaac gaaaagataa tgaagaagca aacaactcat tggtatgtta tttgatagag 60
tgaactgtaa agtattgaat tgtagatatc atgtggctt aaaaatttga tatgtgttat 120
tttggcagga gtcattttct gctttcgca aggatgctgc caatgttctg gatttcctag 180
65 agagattaaa gaatgaagaa gatcaaaaagg ctgttgatgt ggatctgatt gaaagcctga 240
aattgaagct gacatttatt tgtacatatg tccagcttc ttattccgat ttggagaagt 300

12

	ttgaagatat aatgactaga aaaagacaag aggttgagaa tctgcttcaa ccaattttgg	360
	atgatgatgg caaagacgtc gggtgtaaat atgtccttac tagcctcgcc ggtatatgg	420
5	atgactgtat aagcttgtat catcgttcta aatcagatgc caccatgatg gatgagcaat	480
	tgggcttcct cctcttgaat ctctctcatc tatccaagca tcgtgctgaa aagatgttc	540
10	ctggagtgac tcaatatgag gttcttcaga atgtatgtgg caacataaga gatttccatg	600
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10 The initiation codon (ATG position 1546-1548) and the termination
10 codon (TAG position 5433-5435)

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35 The initiation codon (ATG position 1546-1548) and the termination
35 codon (TAG position 5433-5435)

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23

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<211> 9949

<212> DNA

45 <213> Solanum bulbocastanum

50 <220>

<221> genomic_DNA_fragment

55 <222> (1)..(9949)

55 <223> Sequence of 9949 bp Sau3AI genomic DNA fragment of S. bulbocastanum 2002 BAC BlbSP39 present in pSP39-20. The genomic fragment harbours the Rpi-blb2 gene including natural elements necessary for expression: Initiation codon (ATG position 1413-1415), the termination codon (TAG position 5300-5303)

65 <220>

<221> start_codon

<222> (1413)..(1415)

5 <223> Sequence of 9949 bp Sau3AI genomic DNA fragment of *S. bulbocastanum* 2002 BAC BlbSP39 present in pSP39-20. The genomic fragment harbours the Rpi-blb2 gene including natural elements necessary for expression. Iinitiation codon (ATG position 1413-1415), the termination codon (TAG position 5300-5303)

10 <220>

15 <221> stop_codon

15 <222> (5300)..(5303)

20 <223> Sequence of 9949 bp Sau3AI genomic DNA fragment of *S. bulbocastanum* 2002 BAC BlbSP39 present in pSP39-20. The genomic fragment harbours the Rpi-blb2 gene including natural elements necessary for expression. Iinitiation codon (ATG position 1413-1415), the termination codon (TAG position 5300-5303)

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26

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29

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	atgagtcaca ataaggtagt ttaactttcc aactaacctt ttgtatctct atggatcatt	9720
	aaaaggatcg tcgtcatctt tcataagatg catattggga accattggag aacttcaggg	9780
10	tttggctgcc atctttcaat tttctgcaag tagatcgaga gaatatattc tctaagacaa	9840
	aagaattccc tttttgttcc tatttacttc tactcccaaa atgtatttca attgacccaa	9900
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	1 5 10 15	

45	ttt tct gct ctt agc aag gac att gcc gat gtt ctg gtt ttc cta gag	96
	Phe Ser Ala Leu Ser Lys Asp Ile Ala Asp Val Leu Val Phe Leu Glu	
	20 25 30	

50	aat gag gaa aat caa aaa gct ctt gac aaa gat caa gtt gaa aag ata	144
	Asn Glu Glu Asn Gln Lys Ala Leu Asp Lys Asp Gln Val Glu Lys Ile	
	35 40 45	

55	aaa ttg aaa atg gca ttt att tgt aca tat gtt cag ctt tct tgt tcc	192
	Lys Leu Lys Met Ala Phe Ile Cys Thr Val Gln Leu Ser Cys Ser	
	50 55 60	

60	gat ttt gag cag ttt gaa gat ata atg act aga aaa aga caa gag gtt	240
	Asp Phe Glu Gln Phe Glu Asp Ile Met Thr Arg Lys Arg Gln Glu Val	
	65 70 75 80	

65	gag aat ctg ctt caa cca ctt ttg gat gat gat gtc ttt act agc ctc	288
	Glu Asn Leu Leu Gln Pro Leu Leu Asp Asp Asp Val Phe Thr Ser Leu	
	85 90 95	

70	acc agt aat atg gat gac tgt atc agc ttg tat cat cgt tct tat aaa	336
	Thr Ser Asn Met Asp Asp Cys Ile Ser Leu Tyr His Arg Ser Tyr Lys	
	100 105 110	

75	tca gat gcc atc atg atg gat gag caa ttg gac ttc ctc ctc ttg aat	384
	Ser Asp Ala Ile Met Met Asp Glu Gln Leu Asp Phe Leu Leu Asn	

	115	120	125	
5	ctc tat cat cta tcc aag cat cac gct gaa aag ata ttt cct gga gtg Leu Tyr His Leu Ser Lys His His Ala Glu Lys Ile Phe Pro Gly Val 130 135 140			432
10	actcaa tat gaa gtt ctt cag aat ata tgt ggc aac ata aga gat ttc Thr Gln Tyr Glu Val Leu Gln Asn Ile Cys Gly Asn Ile Arg Asp Phe 145 150 155 160			480
15	cat ggg ttg ata gtg aat ggt tgc att aag cat gag atg gtt gag aat His Gly Leu Ile Val Asn Gly Cys Ile Lys His Glu Met Val Glu Asn 165 170 175			528
20	gtc ttr cct ctg ttt caa ctc atg gct gac aga gta gga cac ttc ctt Val Xaa Pro Leu Phe Gln Leu Met Ala Asp Arg Val Gly His Phe Leu 180 185 190			576
25	tgg gat gat cag act gat gaa gac tct cga ctc tcc gag cta gat gag Trp Asp Asp Gln Thr Asp Glu Asp Ser Arg Leu Ser Glu Leu Asp Glu 195 200 205			624
30	gat gaa caa aat gat aga gac tct cga ctt ttc aag cta gca cat cta Asp Glu Gln Asn Asp Arg Asp Ser Arg Leu Phe Lys Leu Ala His Leu 210 215 220			672
35	ctc ttg aag atc gtt ccg gtt gaa ctg gag gtt ata cac ata tgt tat Leu Leu Lys Ile Val Pro Val Glu Leu Glu Val Ile His Ile Cys Tyr 225 230 235 240			720
40	aca aac ttg aaa gct tca act tca gct gaa gtt gga ctc ttc att aag Thr Asn Leu Lys Ala Ser Thr Ser Ala Glu Val Gly Leu Phe Ile Lys 245 250 255			768
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55	cga aac att cat gtc atg atg gaa ttc cta tta ctt att ctt tct gat Arg Asn Ile His Val Met Met Glu Phe Leu Leu Leu Ile Leu Ser Asp 290 295 300			912
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70	gaa gag gaa cca agg aat aaa gag ggt aat aac caa aca aat tgt gca Glu Glu Glu Pro Arg Asn Lys Glu Gly Asn Asn Gln Thr Asn Cys Ala 340 345 350			1056
75	acc cta gac ttg ctg gaa aat att gaa ctc ctc aag aaa gat ctc aaa Thr Leu Asp Leu Leu Glu Asn Ile Glu Leu Leu Lys Lys Asp Leu Lys 355 360 365			1104
80	cat gtt tat ctg aaa gcc ctg gat tca tct caa tgt tgc ttc ccc atg His Val Tyr Leu Lys Ala Leu Asp Ser Ser Gln Cys Cys Phe Pro Met 370 375 380			1152
85	agt gat gga cca ctc ttc atg cat ctt cta cac ata cac tta aat gat Ser Asp Gly Pro Leu Phe Met His Leu Leu His Ile His Leu Asn Asp			1200

	385	390	395	400	
	ttg tta gat tct aat gct tat tca att gct ttg ata aag gaa gaa atc Leu Leu Asp Ser Asn Ala Tyr Ser Ile Ala Leu Ile Lys Glu Glu Ile				1248
5	405		410	415	
	gag ctg gtg aag caa gac ctg aaa ttc ata aga tca ttc ttt gtg gat Glu Leu Val Lys Gln Asp Leu Lys Phe Ile Arg Ser Phe Phe Val Asp				1296
	420	425		430	
10	gct gag caa gga ttg tat aaa gat ctc tgg gca cgt gtt cta gat gtg Ala Glu Gln Gly Leu Tyr Lys Asp Leu Trp Ala Arg Val Leu Asp Val				1344
	435	440	445		
15	gct tat gag gca aaa gat gtc ata gat tca att att gtt cga gat aat Ala Tyr Glu Ala Lys Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn				1392
	450	455	460		
20	ggt ctc tta cat ctt att ttc tca ctt ccc att acc ata aag aag atc Gly Leu Leu His Leu Ile Phe Ser Leu Pro Ile Thr Ile Lys Lys Ile				1440
	465	470	475	480	
25	aaa ctt atc aaa gaa gag atc tct gct tta gat gag aac att ccc aag Lys Leu Ile Lys Glu Glu Ile Ser Ala Leu Asp Glu Asn Ile Pro Lys				1488
	485	490	495		
	gac aga ggt cta atc gtt gtg aac tct ccc aag aaa cca gtt gag aga Asp Arg Gly Leu Ile Val Val Asn Ser Pro Lys Lys Pro Val Glu Arg				1536
	500	505	510		
30	aag tca ttg aca act gat aaa ata act gta ggt ttt gag gag gaa aca Lys Ser Leu Thr Thr Asp Lys Ile Thr Val Gly Phe Glu Glu Thr				1584
	515	520	525		
35	aac ttg ata ctt aga aag ctc acc agt gga tcg gca gat cta gat gtc Asn Leu Ile Leu Arg Lys Leu Thr Ser Gly Ser Ala Asp Leu Asp Val				1632
	530	535	540		
40	att tcg atc act ggt atg ccg ggt tca ggt aaa act act ttg gca tac Ile Ser Ile Thr Gly Met Pro Gly Ser Gly Lys Thr Thr Leu Ala Tyr				1680
	545	550	555	560	
45	aaa gta tac aat gat aag tca gtt tct agc cgt ttc gac ctt cgt gca Lys Val Tyr Asn Asp Lys Ser Val Ser Ser Arg Phe Asp Leu Arg Ala				1728
	565	570	575		
	tgg tgc acg gtc gac caa gga tgt gat gag aag aag ttg ttg aat aca Trp Cys Thr Val Asp Gln Gly Cys Asp Glu Lys Lys Leu Asn Thr				1776
	580	585	590		
50	att ttc agt caa gtt agt gac tca gat tca aaa ttg agt gag aat att Ile Phe Ser Gln Val Ser Asp Ser Asp Ser Lys Leu Ser Glu Asn Ile				1824
	595	600	605		
55	gat gtt gct gat aaa tta cgg aaa caa ctg ttt gga aag agg tat ctt Asp Val Ala Asp Lys Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Leu				1872
	610	615	620		
60	att gtc tta gat gac gtg tgg gat act act aca tgg gat gag tta aca Ile Val Leu Asp Asp Val Trp Asp Thr Thr Trp Asp Glu Leu Thr				1920
	625	630	635	640	
65	aga cct ttt cct gaa tct aag aaa gga agt agg att att ttg aca act Arg Pro Phe Pro Glu Ser Lys Lys Gly Ser Arg Ile Ile Leu Thr Thr				1968
	645	650	655		
	cgg gaa aag gaa gtg gct ttg cat gga aag ctg aac act gat cct ctt Arg Glu Lys Glu Val Ala Leu His Gly Lys Leu Asn Thr Asp Pro Leu				2016

	660	665	670	
				2064
5	gac ctt cga ttg cta aga cca gat gaa agt tgg gaa cta tta gag aaa Asp Leu Arg Leu Leu Arg Pro Asp Glu Ser Trp Glu Leu Leu Glu Lys 675 680 685			
				2112
10	agg gca ttt ggg aat gag agt tgc cct gat gaa cta tta gat gtc ggt Arg Ala Phe Gly Asn Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly 690 695 700			
				2160
15	aaa gaa ata gcc gaa aat tgt aaa ggg ctt cct ttg gtc gct gat ctg Lys Glu Ile Ala Glu Asn Cys Lys Gly Leu Pro Leu Val Ala Asp Leu 705 710 715 720			
				2208
20	att gct gga gtc att gct ggg agg gaa aag aaa agg agt gtc tgg ctt Ile Ala Gly Val Ile Ala Gly Arg Glu Lys Lys Arg Ser Val Trp Leu 725 730 735			
				2256
25	gaa gtt caa agt agt ttg agt tct ttt att ttg aac agt gaa gtc gaa Glu Val Gln Ser Ser Leu Ser Ser Phe Ile Leu Asn Ser Glu Val Glu 740 745 750			
				2304
30	gtg atg aaa gtt ata gaa tta agt tat gac cat tta cca cat cac ctc Val Met Lys Val Ile Glu Leu Ser Tyr Asp His Leu Pro His His Leu 755 760 765			
				2352
35	aag cca tgc ttg ctg tat ttt gca agt ttt ccg aag gac act tca ttg Lys Pro Cys Leu Leu Tyr Phe Ala Ser Phe Pro Lys Asp Thr Ser Leu 770 775 780			
				2400
40	aca atc tat gag ttg aat gtt tat ttc ggt gct gaa gga ttt gtc gga Thr Ile Tyr Glu Leu Asn Val Tyr Phe Gly Ala Glu Gly Phe Val Gly 785 790 795 800			
				2448
45	aag acg gag atg aac agt atg gaa gaa gtc gtc aag att tat atg gat Lys Thr Glu Met Asn Ser Met Glu Val Val Lys Ile Tyr Met Asp 805 810 815			
				2496
50	gat tta att tac agt agc ttg gta att tgc aat gag ata ggt tat Asp Leu Ile Tyr Ser Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Tyr 820 825 830			
				2544
55	gca ctg aat ttc caa att cat gat ctt gtc cat gac ttt tgc ttg ata Ala Leu Asn Phe Gln Ile His Asp Leu Val His Asp Phe Cys Leu Ile 835 840 845			
				2592
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				2640
65	tca gat ttg ttg cct cgt caa att acc att gat tgc gat gag gag gag Ser Asp Leu Leu Pro Arg Gln Ile Thr Ile Asp Cys Asp Glu Glu Glu 865 870 875 880			
				2688
70	cac ttt ggg ctt aat ttg gtc atg ttc gat tca aat aag aaa agg cat His Phe Gly Leu Asn Phe Val Met Phe Asp Ser Asn Lys Lys Arg His 885 890 895			
				2736
75	tct ggt aaa cac ctc tat tct ttg agg ata att gga gac cag ctg gat Ser Gly Lys His Leu Tyr Ser Leu Arg Ile Ile Gly Asp Gln Leu Asp 900 905 910			
				2784
80	gac agt gtt tct gat gca ttt cac cta aga cac ttg agg ctt ctt aga Asp Ser Val Ser Asp Ala Phe His Leu Arg His Leu Arg Leu Leu Arg 915 920 925			
				2832

	930	935	940	
				2880
	aat gaa ata tgc atg ttg aat cat ttg agg tac tta tcc att gac aca			
	Asn Glu Ile Cys Met Leu Asn His Leu Arg Tyr Leu Ser Ile Asp Thr			
5	945	950	955	960
	caa gtt aaa tat ctg cct ttg tct ttc tca aac ctc tgg aat cta gaa			2928
	Gln Val Lys Tyr Leu Pro Leu Ser Phe Ser Asn Leu Trp Asn Leu Glu			
	965	970	975	
10	agc ctg ttt gtg tct acc aac aga tca atc ttg gta cta tta ccg aga			2976
	Ser Leu Phe Val Ser Thr Asn Arg Ser Ile Leu Val Leu Leu Pro Arg			
	980	985	990	
15	att ttg gat ctt gta aag ttg cga gtg ctg tcc gtg gat gct tgt tct			3024
	Ile Leu Asp Leu Val Lys Leu Arg Val Leu Ser Val Asp Ala Cys Ser			
	995	1000	1005	
20	ttc ttt gat atg gat gca gat gaa tca ata ttg ata gca gag gac			3069
	Phe Phe Asp Met Asp Ala Asp Glu Ser Ile Leu Ile Ala Glu Asp			
	1010	1015	1020	
	aca aag tta gag aac ttg aga ata tta acg gaa ctg ttg att tcc			3114
	Thr Lys Leu Glu Asn Leu Arg Ile Leu Thr Glu Leu Leu Ile Ser			
25	1025	1030	1035	
	tat tcg aaa gat aca aag aat att ttc aaa agg ttt ccc aat ctt			3159
	Tyr Ser Lys Asp Thr Lys Asn Ile Phe Lys Arg Phe Pro Asn Leu			
	1040	1045	1050	
30	cag ttg ctt tca ttt gaa ctc aag gag tca tgg gat tat tca aca			3204
	Gln Leu Leu Ser Phe Glu Leu Lys Glu Ser Trp Asp Tyr Ser Thr			
	1055	1060	1065	
35	gag caa cat tgg ttc tcg gaa ttg gat ttc cta act gaa cta gaa			3249
	Glu Gln His Trp Phe Ser Glu Leu Asp Phe Leu Thr Glu Leu Glu			
	1070	1075	1080	
40	aca ctc tct gta ggt ttt aaa agt tca aac aca aac gat agt ggg			3294
	Thr Leu Ser Val Gly Phe Lys Ser Ser Asn Thr Asn Asp Ser Gly			
	1085	1090	1095	
	tcc tct gta gcg aca aat cgg ccg tgg gat ttt cac ttc cct tca			3339
	Ser Ser Val Ala Thr Asn Arg Pro Trp Asp Phe His Phe Pro Ser			
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	aat ttg aaa ata ctg tgg ttg cgt gaa ttt ccg ctg aca tcc gat			3384
	Asn Leu Lys Ile Leu Trp Leu Arg Glu Phe Pro Leu Thr Ser Asp			
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	Ser Leu Ser Thr Ile Ala Arg Leu Pro Asn Leu Glu Glu Leu Ser			
	1130	1135	1140	
55	ctt tat cat aca atc atc cat gga gaa gaa tgg aac atg ggg gag			3474
	Leu Tyr His Thr Ile Ile His Gly Glu Glu Trp Asn Met Gly Glu			
	1145	1150	1155	
60	gaa gac acc ttt gag aat ctc aaa ttt ttg aac ttc aat caa gtt			3519
	Glu Asp Thr Phe Glu Asn Leu Lys Phe Leu Asn Phe Asn Gln Val			
	1160	1165	1170	
	agt att tcc aag tgg gag gtt gga gag gaa tcc ttc ccc aat ctt			3564
	Ser Ile Ser Lys Trp Glu Val Gly Glu Glu Ser Phe Pro Asn Leu			
65	1175	1180	1185	
	gag aaa tta aaa ctg cgg gga tgt cat aag cta gag gag att cca			3609
	Glu Lys Leu Lys Leu Arg Gly Cys His Lys Leu Glu Glu Ile Pro			

	1190	1195	1200	
	cct agt ttt gga gat att tat	tca ttg aaa tct atc	aaa att gta	3654
5	Pro Ser Phe Gly Asp Ile Tyr	Ser Leu Lys Ser	Ile Lys Ile Val	
	1205	1210	1215	
	aag agt cct caa ctt gaa gat	tct gct ctc aaa att	aag gaa tac	3699
	Lys Ser Pro Gln Leu Glu Asp	Ser Ala Leu Lys	Ile Lys Glu Tyr	
	1220	1225	1230	
10	gct gaa gat atg agg gga ggg	gac gag ctt cag atc	ctt ggc caa	3744
	Ala Glu Asp Met Arg Gly Gly	Asp Glu Leu Gln	Ile Leu Gly Gln	
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	Asn Glu Glu Asn Gln Lys Ala Leu Asp Lys Asp Gln Val Glu Lys Ile			
	35 40 45			
50	Lys Leu Lys Met Ala Phe Ile Cys Thr Tyr Val Gln Leu Ser Cys Ser			
	50 55 60			
55	Asp Phe Glu Gln Phe Glu Asp Ile Met Thr Arg Lys Arg Gln Glu Val			
	65 70 75 80			
60	Glu Asn Leu Leu Gln Pro Leu Leu Asp Asp Asp Val Phe Thr Ser Leu			
	85 90 95			
	Thr Ser Asn Met Asp Asp Cys Ile Ser Leu Tyr His Arg Ser Tyr Lys			
65	100 105 110			
	Ser Asp Ala Ile Met Met Asp Glu Gln Leu Asp Phe Leu Leu Asn			

	115	120	125
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10	Thr Gln Tyr Glu Val Leu Gln Asn Ile Cys Gly Asn Ile Arg Asp Phe		
	145	150	155
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	His Gly Leu Ile Val Asn Gly Cys Ile Lys His Glu Met Val Glu Asn		
	165	170	175
15	Val Xaa Pro Leu Phe Gln Leu Met Ala Asp Arg Val Gly His Phe Leu		
	180	185	190
20	Trp Asp Asp Gln Thr Asp Glu Asp Ser Arg Leu Ser Glu Leu Asp Glu		
	195	200	205
25	Asp Glu Gln Asn Asp Arg Asp Ser Arg Leu Phe Lys Leu Ala His Leu		
	210	215	220
30	Leu Leu Lys Ile Val Pro Val Glu Leu Glu Val Ile His Ile Cys Tyr		
	225	230	235
	240		
	Thr Asn Leu Lys Ala Ser Thr Ser Ala Glu Val Gly Leu Phe Ile Lys		
	245	250	255
35	Gln Leu Leu Glu Thr Ser Pro Asp Ile Leu Arg Glu Tyr Leu Ile Pro		
	260	265	270
40	Leu Gln Glu His Met Val Thr Val Ile Thr Pro Ser Thr Ser Gly Ala		
	275	280	285
45	Arg Asn Ile His Val Met Met Glu Phe Leu Leu Leu Ile Leu Ser Asp		
	290	295	300
50	Met Pro Lys Asp Phe Ile His His Asp Lys Leu Phe Asp Leu Leu Asp		
	305	310	315
	320		
	Arg Val Gly Val Leu Thr Arg Glu Val Ser Thr Leu Val Arg Asp Leu		
	325	330	335
55	Glu Glu Glu Pro Arg Asn Lys Glu Gly Asn Asn Gln Thr Asn Cys Ala		
	340	345	350
60	Thr Leu Asp Leu Leu Glu Asn Ile Glu Leu Leu Lys Lys Asp Leu Lys		
	355	360	365
65	His Val Tyr Leu Lys Ala Leu Asp Ser Ser Gln Cys Cys Phe Pro Met		
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	Ser Asp Gly Pro Leu Phe Met His Leu Leu His Ile His Leu Asn Asp		

385

390

395

400

5 Leu Leu Asp Ser Asn Ala Tyr Ser Ile Ala Leu Ile Lys Glu Glu Ile
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10 Glu Leu Val Lys Gln Asp Leu Lys Phe Ile Arg Ser Phe Phe Val Asp
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15 Ala Glu Gln Gly Leu Tyr Lys Asp Leu Trp Ala Arg Val Leu Asp Val
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20 Ala Tyr Glu Ala Lys Asp Val Ile Asp Ser Ile Ile Val Arg Asp Asn
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25 Gly Leu Leu His Leu Ile Phe Ser Leu Pro Ile Thr Ile Lys Lys Ile
465 470 475 480

30 Lys Leu Ile Lys Glu Glu Ile Ser Ala Leu Asp Glu Asn Ile Pro Lys
485 490 495

35 Asp Arg Gly Leu Ile Val Val Asn Ser Pro Lys Lys Pro Val Glu Arg
500 505 510

40 Lys Ser Leu Thr Thr Asp Lys Ile Thr Val Gly Phe Glu Glu Glu Thr
515 520 525

45 Asn Leu Ile Leu Arg Lys Leu Thr Ser Gly Ser Ala Asp Leu Asp Val
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50 Ile Ser Ile Thr Gly Met Pro Gly Ser Gly Lys Thr Thr Leu Ala Tyr
545 550 555 560

55 Lys Val Tyr Asn Asp Lys Ser Val Ser Ser Arg Phe Asp Leu Arg Ala
565 570 575

60 Trp Cys Thr Val Asp Gln Gly Cys Asp Glu Lys Lys Leu Leu Asn Thr
580 585 590

65 Ile Phe Ser Gln Val Ser Asp Ser Asp Ser Lys Leu Ser Glu Asn Ile
595 600 605

70 Asp Val Ala Asp Lys Leu Arg Lys Gln Leu Phe Gly Lys Arg Tyr Le
610 615 620

75 Ile Val Leu Asp Asp Val Trp Asp Thr Thr Thr Trp Asp Glu Leu Thr
625 630 635 640

80 Arg Pro Phe Pro Glu Ser Lys Lys Gly Ser Arg Ile Ile Leu Thr Th
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660 665 670

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10 Arg Ala Phe Gly Asn Glu Ser Cys Pro Asp Glu Leu Leu Asp Val Gly
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705 710 715 720

20 Ile Ala Gly Val Ile Ala Gly Arg Glu Lys Lys Arg Ser Val Trp Leu
725 730 735

25 Glu Val Gln Ser Ser Leu Ser Ser Phe Ile Leu Asn Ser Glu Val Glu
740 745 750

30 Val Met Lys Val Ile Glu Leu Ser Tyr Asp His Leu Pro His His Leu
755 760 765

35 Lys Pro Cys Leu Leu Tyr Phe Ala Ser Phe Pro Lys Asp Thr Ser Leu
770 775 780

40 Thr Ile Tyr Glu Leu Asn Val Tyr Phe Gly Ala Glu Gly Phe Val Gly
785 790 795 800

45 Lys Thr Glu Met Asn Ser Met Glu Val Val Lys Ile Tyr Met Asp
805 810 815

50 Asp Leu Ile Tyr Ser Ser Leu Val Ile Cys Phe Asn Glu Ile Gly Tyr
820 825 830

55 Ala Leu Asn Phe Gln Ile His Asp Leu Val His Asp Phe Cys Leu Ile
835 840 845

60 Lys Ala Arg Lys Glu Asn Leu Phe Asp Gln Ile Arg Ser Ser Ala Pro
850 855 860

65 Ser Asp Leu Leu Pro Arg Gln Ile Thr Ile Asp Cys Asp Glu Glu
865 870 875 880

70 His Phe Gly Leu Asn Phe Val Met Phe Asp Ser Asn Lys Lys Arg His
885 890 895

75 Ser Gly Lys His Leu Tyr Ser Leu Arg Ile Ile Gly Asp Gln Leu Asp
900 905 910

80 Asp Ser Val Ser Asp Ala Phe His Leu Arg His Leu Arg Leu Leu Arg
915 920 925

85 Val Leu Asp Leu His Thr Ser Phe Ile Met Val Lys Asp Ser Leu Leu

	930	935	940
5	Asn Glu Ile Cys Met Leu Asn His Leu Arg Tyr Leu Ser Ile Asp Thr 945 950 955 960		
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	Glu Asn Leu Leu Gln Ser Leu Leu Asp Asp Val Leu Thr Ser Leu			
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	Thr Ser Asn Met Asp Asp Cys Ile Ser Leu Tyr His Arg Ser Tyr Lys			
	100 105 110			

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	Val Leu Pro Leu Phe Gln Leu Met Ala Glu Arg Val Gly His Phe Leu	
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44

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	Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val				
	100	105	110		
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	Met Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu				
	115	120	125		
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	His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser				
	130	135	140		
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	Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val				
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	Leu Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu				
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80

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				1104
	gca gcc aaa act ctt gga ggt att ttg tgc ttc aag aga gaa gaa aga			
	Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg			
5	355	360	365	
	gca tgg gaa cat gtg aga gac agt ccg att tgg aat ttg cct caa gat			1152
	Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp			
	370	375	380	
10	gaa agt tct att ctg cct gcc ctg agg ctt agt tac cat caa ctt cca			1200
	Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro			
	385	390	395	400
15	ctt gat ttg aaa caa tgc ttt gcg tat tgt gcg gtg ttc cca aag gat			1248
	Leu Asp Leu Lys Gln Cys Phe Ala Tyr Cys Ala Val Phe Pro Lys Asp			
	405	410	415	
20	gcc aaa atg gaa aaa gaa aag cta atc tct ctc tgg atg gcg cat ggt			1296
	Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly			
	420	425	430	
25	ttt ctt tta tca aaa gga aac atg gag cta gag gat gtg ggc gat gaa			1344
	Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu			
	435	440	445	
	gta tgg aaa gaa tta tac ttg agg tct ttt ttc caa gag att gaa gtt			1392
	Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val			
	450	455	460	
30	aaa gat ggt aaa act tat ttc aag atg cat gat ctc atc cat gat ttg			1440
	Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu			
	465	470	475	480
35	gca aca tct ctg ttt tca gca aac aca tca agc agc aat atc cgt gaa			1488
	Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu			
	485	490	495	
40	ata aat aaa cac agt tac aca cat atg atg tcc att ggt ttc gcc gaa			1536
	Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu			
	500	505	510	
45	gtg gtg ttt tac act ctt ccc ccc ttg gaa aag ttt atc tcg tta			1584
	Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu			
	515	520	525	
	aga gtg ctt aat cta ggt gat tcg aca ttt aat aag tta cca tct tcc			1632
	Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser			
	530	535	540	
50	att gga gat cta gta cat tta aga tac ttg aac ctg tat ggc agt ggc			1680
	Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly			
	545	550	555	560
55	atg cgt agt ctt cca aag cag tta tgc aag ctt caa aat ctg caa act			1728
	Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr			
	565	570	575	
60	ctt gat cta caa tat tgc acc aag ctt tgt ttg cca aaa gaa aca			1776
	Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr			
	580	585	590	
65	agt aaa ctt ggt agt ctc cga aat ctt tta ctt gat ggt agc cag tca			1824
	Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Asp Gly Ser Gln Ser			
	595	600	605	
	ttg act tgt atg cca cca agg ata gga tca ttg aca tgc ctt aag act			1872
	Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr			

	610	615	620	
5	cta ggt caa ttt gtt gtt gga agg aag aaa ggt tat caa ctt ggt gaa Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640			1920
	cta gga aac cta aat ctc tat ggc tca att aaa atc tcg cat ctt gag Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu 645 650 655			1968
10	aga gtg aag aat gat aag gac gca aaa gaa gcc aat tta tct gca aaa Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys 660 665 670			2016
15	ggg aat ctg cat tct tta agc atg agt tgg aat aac ttt gga cca cat Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His 675 680 685			2064
20	ata tat gaa tca gaa gaa gtt aaa gtg ctt gaa gcc ctc aaa cca cac Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His 690 695 700			2112
25	tcc aat ctg act tct tta aaa atc tat ggc ttc aga gga atc cat ctc Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu 705 710 715 720			2160
	cca gag tgg atg aat cac tca gta ttg aaa aat att gtc tct att cta Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu 725 730 735			2208
30	att agc aac ttc aga aac tgc tca tgc tta cca ccc ttt ggt gat ctg Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu 740 745 750			2256
35	cct tgt cta gaa agt cta gag tta cac tgg ggg tct gcg gat gtg gag Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu 755 760 765			2304
40	tat gtt gaa gaa gtg gat att gat gtt cat tct gga ttc ccc aca aga Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg 770 775 780			2352
45	ata agg ttt cca tcc ttg agg aaa ctt gat ata tgg gac ttt ggt agt Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser 785 790 795 800			2400
	ctg aaa gga ttg ctg aaa aag gaa gga gaa gag caa ttc cct gtg ctt Leu Lys Gly Leu Leu Lys Glu Gly Glu Glu Gln Phe Pro Val Leu 805 810 815			2448
50	gaa gag atg ata att cac gag tgc cct ttt ctg acc ctt tct tct aat Glu Glu Met Ile Ile His Glu Cys Pro Phe Leu Thr Leu Ser Ser Asn 820 825 830			2496
55	ctt agg gct ctt act tcc ctc aga att tgc tat aat aaa gta gct act Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr 835 840 845			2544
60	tca ttc cca gaa gag atg ttc aaa aac ctt gca aat ctc aaa tac ttg Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu 850 855 860			2592
65	aca atc tct cgg tgc aat aat ctc aaa gag ctg cct acc agc ttg gct Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala 865 870 875 880			2640
	agt ctg aat gct ttg aaa agt cta aaa att caa ttg tgc gca cta Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu			2688

82

885

890

895

5	gag agt ctc cct gag gaa ggg ctg gaa ggt tta tct tca ctc aca gag Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu 900 905 910	2736
10	tta ttt gtt gaa cac tgt aac atg cta aaa tgt tta cca gag gga ttg Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu 915 920 925	2784
15	cag cac cta aca acc ctc aca agt tta aaa att cgg gga tgt cca caa Gln His Leu Thr Thr Leu Ser Leu Lys Ile Arg Gly Cys Pro Gln 930 935 940	2832
20	ctg atc aag cgg tgt gag aag gga ata gga gaa gac tgg cac aaa att Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile 945 950 955 960	2880
25	tct cac att cct aat gtg aat ata tat att taa Ser His Ile Pro Asn Val Asn Ile Tyr Ile 965 970	2913
30	<210> 94 <211> 970 <212> PRT <213> Solanum bulbocastanum	
35	<400> 94 Met Ala Glu Ala Phe Ile Gln Val Leu Leu Asp Asn Leu Thr Ser Phe 1 5 10 15	
40	Leu Lys Gly Glu Leu Val Leu Leu Phe Gly Phe Gln Asp Glu Phe Gln 20 25 30	
45	Arg Leu Ser Ser Met Phe Ser Thr Ile Gln Ala Val Leu Glu Asp Ala 35 40 45	
50	Gln Glu Lys Gln Leu Asn Asn Lys Pro Leu Glu Asn Trp Leu Gln Lys 50 55 60	
55	Leu Asn Ala Ala Thr Tyr Glu Val Asp Asp Ile Leu Asp Glu Tyr Lys 65 70 75 80	
60	Thr Lys Ala Thr Arg Phe Ser Gln Ser Glu Tyr Gly Arg Tyr His Pro 85 90 95	
65	Lys Val Ile Pro Phe Arg His Lys Val Gly Lys Arg Met Asp Gln Val 100 105 110	
	Met Lys Lys Leu Lys Ala Ile Ala Glu Glu Arg Lys Asn Phe His Leu 115 120 125	
	His Glu Lys Ile Val Glu Arg Gln Ala Val Arg Arg Glu Thr Gly Ser	

	130	135	140	
5	Val Leu Thr Glu Pro Gln Val Tyr Gly Arg Asp Lys Glu Lys Asp Glu 145	150	155	160
10	Ile Val Lys Ile Leu Ile Asn Asn Val Ser Asp Ala Gln His Leu Ser 165	170	175	
15	Val Leu Pro Ile Leu Gly Met Gly Gly Leu Gly Lys Thr Thr Leu Ala 180	185	190	
20	Gln Met Val Phe Asn Asp Gln Arg Val Thr Glu His Phe His Ser Lys 195	200	205	
25	Ile Trp Ile Cys Val Ser Glu Asp Phe Asp Glu Lys Arg Leu Ile Lys 210	215	220	
30	Ala Ile Val Glu Ser Ile Glu Gly Arg Pro Leu Leu Gly Glu Met Asp 225	230	235	240
35	Leu Ala Pro Leu Gln Lys Lys Leu Gln Glu Leu Leu Asn Gly Lys Arg 245	250	255	
40	Tyr Leu Leu Val Leu Asp Asp Val Trp Asn Glu Asp Gln Gln Lys Trp 260	265	270	
45	Ala Asn Leu Arg Ala Val Leu Lys Val Gly Ala Ser Gly Ala Ser Val 275	280	285	
50	Leu Thr Thr Thr Arg Leu Glu Lys Val Gly Ser Ile Met Gly Thr Leu 290	295	300	
55	Gln Pro Tyr Glu Leu Ser Asn Leu Ser Gln Glu Asp Cys Trp Leu Leu 305	310	315	320
60	Phe Met Gln Arg Ala Phe Gly His Gln Glu Glu Ile Asn Pro Asn Leu 325	330	335	
65	Val Ala Ile Gly Lys Glu Ile Val Lys Lys Ser Gly Gly Val Pro Leu 340	345	350	
70	Ala Ala Lys Thr Leu Gly Gly Ile Leu Cys Phe Lys Arg Glu Glu Arg 355	360	365	
75	Ala Trp Glu His Val Arg Asp Ser Pro Ile Trp Asn Leu Pro Gln Asp 370	375	380	
80	Glu Ser Ser Ile Leu Pro Ala Leu Arg Leu Ser Tyr His Gln Leu Pro 385	390	395	400

	84	410	415
5	Ala Lys Met Glu Lys Glu Lys Leu Ile Ser Leu Trp Met Ala His Gly 420 425 430		
10	Phe Leu Leu Ser Lys Gly Asn Met Glu Leu Glu Asp Val Gly Asp Glu 435 440 445		
15	Val Trp Lys Glu Leu Tyr Leu Arg Ser Phe Phe Gln Glu Ile Glu Val 450 455 460		
20	Lys Asp Gly Lys Thr Tyr Phe Lys Met His Asp Leu Ile His Asp Leu 465 470 475 480		
25	Ala Thr Ser Leu Phe Ser Ala Asn Thr Ser Ser Ser Asn Ile Arg Glu 485 490 495		
30	Ile Asn Lys His Ser Tyr Thr His Met Met Ser Ile Gly Phe Ala Glu 500 505 510		
35	Val Val Phe Phe Tyr Thr Leu Pro Pro Leu Glu Lys Phe Ile Ser Leu 515 520 525		
40	Arg Val Leu Asn Leu Gly Asp Ser Thr Phe Asn Lys Leu Pro Ser Ser 530 535 540		
45	Ile Gly Asp Leu Val His Leu Arg Tyr Leu Asn Leu Tyr Gly Ser Gly 545 550 555 560		
50	Met Arg Ser Leu Pro Lys Gln Leu Cys Lys Leu Gln Asn Leu Gln Thr 565 570 575		
55	Leu Asp Leu Gln Tyr Cys Thr Lys Leu Cys Cys Leu Pro Lys Glu Thr 580 585 590		
60	Ser Lys Leu Gly Ser Leu Arg Asn Leu Leu Asp Gly Ser Gln Ser 595 600 605		
65	Leu Thr Cys Met Pro Pro Arg Ile Gly Ser Leu Thr Cys Leu Lys Thr 610 615 620		
70	Leu Gly Gln Phe Val Val Gly Arg Lys Lys Gly Tyr Gln Leu Gly Glu 625 630 635 640		
75	Leu Gly Asn Leu Asn Leu Tyr Gly Ser Ile Lys Ile Ser His Leu Glu 645 650 655		
80	Arg Val Lys Asn Asp Lys Asp Ala Lys Glu Ala Asn Leu Ser Ala Lys 660 665 670		
85	Gly Asn Leu His Ser Leu Ser Met Ser Trp Asn Asn Phe Gly Pro His		

85

	675	680	685
5	Ile Tyr Glu Ser Glu Glu Val Lys Val Leu Glu Ala Leu Lys Pro His 690	695	700
10	Ser Asn Leu Thr Ser Leu Lys Ile Tyr Gly Phe Arg Gly Ile His Leu 705	710	715
15	Pro Glu Trp Met Asn His Ser Val Leu Lys Asn Ile Val Ser Ile Leu 725	730	735
20	Ile Ser Asn Phe Arg Asn Cys Ser Cys Leu Pro Pro Phe Gly Asp Leu 740	745	750
25	Pro Cys Leu Glu Ser Leu Glu Leu His Trp Gly Ser Ala Asp Val Glu 755	760	765
30	Tyr Val Glu Glu Val Asp Ile Asp Val His Ser Gly Phe Pro Thr Arg 770	775	780
35	Ile Arg Phe Pro Ser Leu Arg Lys Leu Asp Ile Trp Asp Phe Gly Ser 785	790	795
40	Leu Lys Gly Leu Leu Lys Glu Gly Glu Glu Gln Phe Pro Val Leu 805	810	815
45	Leu Arg Ala Leu Thr Ser Leu Arg Ile Cys Tyr Asn Lys Val Ala Thr 835	840	845
50	Ser Phe Pro Glu Glu Met Phe Lys Asn Leu Ala Asn Leu Lys Tyr Leu 850	855	860
55	Thr Ile Ser Arg Cys Asn Asn Leu Lys Glu Leu Pro Thr Ser Leu Ala 865	870	875
60	Ser Leu Asn Ala Leu Lys Ser Leu Lys Ile Gln Leu Cys Cys Ala Leu 885	890	895
65	Glu Ser Leu Pro Glu Glu Gly Leu Glu Gly Leu Ser Ser Leu Thr Glu 900	905	910
70	Leu Phe Val Glu His Cys Asn Met Leu Lys Cys Leu Pro Glu Gly Leu 915	920	925
75	Gln His Leu Thr Thr Leu Thr Ser Leu Lys Ile Arg Gly Cys Pro Gln 930	935	940
80	Leu Ile Lys Arg Cys Glu Lys Gly Ile Gly Glu Asp Trp His Lys Ile		

86

945

950

955

960

5 Ser His Ile Pro Asn Val Asn Ile Tyr Ile
965 970